EXHIBIT 4

FILED UNDER SEAL

**IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION**

GOOGLE LLC, *Plaintiff,* v. SONOS, INC., *Defendant.*	Case No. 3:20-cv-06754-WHA Related to Case No. 3:21-cv-07559-WHA

**REBUTTAL EXPERT REPORT
REGARDING DAMAGES**

January 13, 2023

Respectfully Submitted,

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W. Christopher Bakewell

functionality that Sonos claims as the '885 and '966 patents.[466] Even for Google Home Max, the accused functionality was not enough to keep the product on the market.

265. Mr. Malackowski did not appear to mention a 2018 Sonos survey which showed that features such as "sound quality," "ease of use," "ease of set-up" and ability to "play music over Wi-Fi," among others, were considered by the survey respondents as the "most important" features" in wireless speakers.[467] The ability to "play music in multiple rooms" (9% of the respondents), "play different music in different rooms" (7% of respondents), and "play the same song throughout my home" (5% of respondents) had relatively lower rankings compared to "sound quality."[468] Even for Sonos customers, who are reasonably assumed to be more discerning, Mr. Malackowski does not show that they find the technology of the '885 and '966 patents to generate demand in a significant way.[469]

266. Mr. Malackowski disregarded usage data produced by Google for the accused smart speakers, smart displays and streaming devices in the United States. This data covers the period from May 5, 2022 through November 10, 2022.[470] This data includes what I understand to be several potential commands for grouping that I understand can potentially apply: static, dynamic, static stereo pair and dynamic stereo pair. I begin with discussing all four commands, and then discuss what the data shows for what I understand to be narrower applicable commands.

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[466] GOOG-SONOSNDCA-00058536-611, at 598.

[467] SONOS-SVG2-00054685-730 at 707.

[468] I understand, though, that such functionality is more general and broader than the '885 and '966 patents. Interview of Dr. Schonfeld.

[469] To this end, a 2018 Sonos survey showed that features such as "sound quality," "ease of use," "ease of set-up" and ability to "play music over Wi-Fi," among others, were considered by the survey respondents as the "most important" features" in wireless speakers. SONOS-SVG2-00054685-730 at 707. As I discussed above, Mr. Malackowski did not consider that Sonos and Google focus differently on market segments and customers. Sonos more targets audiophiles and those that appreciate high-end music quality, and a "home premium" segment. Interview of Mr. Chan; SONOS-SVG2-00053537-574 at 545; SONOS-SVG2-00055769 at 806; "Sonos One Review: The Best Smart Speaker For Audiophiles," The Guardian, February 15, 2018 (accessed: www.theguardian.com/technology/2018/feb/15/sonos-one-review-best-smart-speaker-audiophiles-amazon-alexa); "How Smart-Speaker Maker Sonos Plans to Take on Apple, Google and Amazon," Variety.com, June 20, 2018 (accessed: https://variety.com/2018/biz/features/sonos-apple-google-amazon-1202850159/?sub_action=logged_in); "Sonos CEO On Tech Competition: We're The Story Of Software Eating Audio," Yahoo Finance, March 10, 2021 (https://www.yahoo.com/video/sonos-ceo-tech-competition-story-175816392.html). Google's smart speakers are generally targeted at more mainstream audiences, including price conscious customers. Interview of Mr. Chan.

[470] GOOG-SONOSNDCA-00117827 (tab titled "Multizone US Events-Daily").

267. Generally, the data shows relatively modest interest in the grouping functionality.   For example, there is data that, on a daily basis, measures when the speakers are put into speaker groups involving the four commands.[471]   Significantly less than 1% (*i.e.*, approximately 0.05% on a weighted average basis) of the accused devices joined a group, on a daily basis, during the period from May 5, 2022 through November 10, 2022, considering any of four commands (*i.e.*, static, dynamic, static stereo pair and dynamic stereo pair) (*see* **Exhibit 4.3**).[472]

268. There is also daily usage data (*i.e.*, "daily active users"); this measures devices[473] that were put into speaker groups, on an aggregate daily basis, during the period from April 20, 2022 through November 10, 2022.[474]   This also shows that less than 1% (*i.e.*, 0.55% on a weighted average basis) of the accused devices were grouped, on an aggregate basis, by users (*see* **Exhibit 4.4**).[475]

269. There is also 28-day usage data (*i.e.*, "monthly active users") measuring devices that were put into speaker groups over a 28-day period, during the period from April 20, 2022 through November 10, 2022.[476]   This shows that less than 3% (*i.e.*, 2.75% on a weighted average basis) of the accused devices were grouped, on an aggregate basis, by users (*see* **Exhibit 4.4**).[477]   Comparing the daily active users to monthly active users shows that users tend not to be engaged with the speaker grouping feature, meaning that they tend to set their speakers but not interact with this feature all that regularly.   More specifically, while on average, less than 3% interact with the feature during a month, far less than 1% do on any given day in that month.

270. However, I understand that the "active user" data is overinclusive in two ways. First, it is not

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[471] *See* **Exhibit 4.3**; Interview of Dr. Schonfeld; Interview of Mr. Chan.
[472] Interview of Dr. Schonfeld; Interview of Mr. Chan. On a 30-day, 100-day and 184-day basis, this centers around 0.05%. *See* **Exhibit 4.3**. I understand from Dr. Schonfeld that static groups are fixed groups that are saved for future use while dynamic groups are groups created on the fly that aren't saved for future use. Multichannel groups can be static or dynamic groups involving stereo pairs.
[473] I refer to the accused smart speakers, smart displays and streaming devices in the United States as "devices."
[474] GOOG-SONOSNDCA-00117827 (tab titled "Daily Multizone").
[475] GOOG-SONOSNDCA-00117827 (tab titled "Daily Multizone"). This centers around 0.58% for 30-day versus 0.56% for 100-day and 0.55% for 200-day, on a weighted average basis. *See* **Exhibit 4.4**.
476 GOOG-SONOSNDCA-00117827 (tab titled "28 Day Multizone").
477 GOOG-SONOSNDCA-00117827 (tab titled "Daily Multizone"). This centers around 2.75% for 30-day versus 2.70% for 100-day and 2.63% for 200-day, on a weighted average basis. *See* **Exhibit 4.4**.

specific to the alleged infringement because it includes all multizone groups, accused and non-accused groups).[478] Second, it includes more commands than are assumed to be infringing.[479]

271. These percentages are still significantly lower than Mr. Malackowski's 29% "feature-based apportionment." For this, Mr. Malackowski uses a 2020 study by NPR that estimates that 29% of U.S. households own three or more smart speakers in their homes.[480] Merely owning a speaker or multiple speakers does not show how often speakers are grouped, and provides very little if any meaningful information about demand for the accused functionality. What Mr. Malackowski does is not really an "apportionment," as it is not specific to either the '885 or '966 patents.[481] I discuss this further in **Section 5.3**, where I walk through each of the steps in Mr. Malackowski's damages theories for the '885 and '966 patents.

272. The data does show that some types of speakers had higher percentage of multizone grouping.[482] For example, approximately 3.3% of Google Home Max speakers (internal codename "Biggie") were grouped, on a daily active user basis, during the period from April 20, 2022 through November 10, 2022, and approximately 14.3% of Google Home Max speakers were grouped, on a 28-day average monthly active user basis, during the period from April 20, 2022 through November 10, 2022.[483] But as I explained above, Google Home Max was discontinued in December 2020.

273. In any event, for users and speakers more interested sound quality, there is somewhat higher interest in grouping. While Sonos continues to focus on this segment, Google's interest has been more modest, and Google has focused on more mainstream users interested in, for example, the overall smart home and Google Assistant.[484]

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[478] Deposition of Christopher Chan, November 29, 2022, pp. 55-56; Interview of Dr. Schonfeld.

[479] Interview of Dr. Schonfeld.

[480] Malackowski Supplemental Report, p. 81.

[481] Interview of Dr. Schonfeld.

[482] GOOG-SONOSNDCA-00115742 (*see* tabs titled "Daily Multizone" and "28 Day Multizone").

[483] GOOG-SONOSNDCA-00115742 (*see* tabs titled "Daily Multizone" and "28 Day Multizone").

[484] Interview of Mr. Chan; Deposition of Chris Chan, November 29, 2022, pp. 105-108; "Google Discontinues The Google Home Max," The Verge, December 14, 2020 (accessed: https://www.theverge.com/2020/12/14/22175243/google-home-max-discontinued-smart-speaker-support). Approximately 3.4% of Nest Audio speakers (internal codename "Prince"), the closest current offering to the Google Home Max, were grouped, on a daily basis, during the period from April 20, 2022 through November

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Rebuttal Expert Report of W. Christopher Bakewell

Exhibit 4.3

Weighted Average Percentage Of Accused U.S. Devices In A Multizone Group (184 Days) [1]
May 5, 2022 - November 10, 2022

	Weighted Daily Average Accused Multizone Events [1] (Units)	Weighted Daily Average Connected Devices [2] (Units)	Weighted Daily Average % of Connected Devices
	[A]	[B]	[C] = [A] / [B]
Number of accused multizone events:			
Cast.Multizone.Common.JoinGroup [3]	4,425	19,746,605	0.022%
Cast.Multizone.Leader.MakeGroupDynamic [4]	4,586	19,746,605	0.023%
Cast.Multizone.Leader.MakeMultichannelGroupDynamic [5]	407	19,746,605	0.002%
Cast.Multizone.Common.AddMultichannelGroup [6]	237	19,746,605	0.001%
Total number of accused multizone events	**9,655**	**19,746,605**	**0.049%**

Notes & Sources:
(1) See Exhibit 4.5; Almeroth Opening Report, p. 7; Interview of Dr. Schonfeld.
(2) See Exhibit 4.5; Unique connected devices. Interview of Mr. Chan and Deposition of Christopher Chan, November 29, 2022, pp. 54-56 and 64-65.
(3) "Cast.Multizone.Common.JoinGroup" refers to a new device added to a static group. Interview of Mr. Chan and Deposition of Christopher Chan, November 29, 2022, Exhibit 1261.
(4) "Cast.Multizone.Leader.MakeGroupDynamic" refers to the creation of a dynamic group. Interview of Mr. Chan and Deposition of Christopher Chan, November 29, 2022, Exhibit 1261. Mr. Mackay testified that a dynamic group "refers to the ability to add or remove devices from an ongoing playback. So -- and it's a temporary association, I guess you would say, of the devices that only exist… as long as the Cast session is ongoing." See Deposition of Kenneth J. Mackay, May 10, 2022, p. 64.
(5) "Cast.Multizone.Leader.MakeMultichannelGroupDynamic" refers to an already-created stereo pair becoming a dynamic group (*i.e.,* a new device was added or removed from playback alongside the stereo pair). Interview of Mr. Chan and Deposition of Christopher Chan, November 29, 2022, Exhibit 1261.
(6) "Cast.Multizone.Common.AddMultichannelGroup" refers to a user creating a static stereo pair in the Google Home App. Interview of Mr. Chan and Deposition of Christopher Chan, November 29, 2022, Exhibit 1261.